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Article

Knowledge Transfer in the Cultural and Creative Sector: Institutional Aspects and Perspectives from Actors in Selected Atlantic Regions

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Abstract: The 21st century has witnessed a growth in the importance given to the third mission of Higher Education Institutions (HEI). This third mission refers to the socioeconomic engagement with the surrounding social and business fabric, namely in the form of knowledge transfer (KT) schemes and policies. Despite its widely-recognized importance, the Cultural and Creative Sector (CCS) has remained only marginally engaged with HEI, in part due to the lack of explicit policy by public actors to bring the two types of actors together. This article seeks to explore the institutional frameworks that have been developed for knowledge transfer from HEI to the CCS in selected regions of the Atlantic Area. Towards this goal, it first analyses some of the sectoral specificities of the CCS, identifying three feature which distinguish the sector: the entrepreneurial structure and organization of CCS; the type of knowledge, innovation and motivations of firms; and their absence of connections to HEI. The article seeks then to analyze to what extent existing policy on CCS and KT policies in the regions has tackled these specificities, through a qualitative analysis of reports, policy documents, and academic analysis of the regional economies, before proposing a model for understanding KT policy in the CCS sector, which serves as a preliminary line of inquiry into the knowledge relations in the CCS. Finally, these policy concerns are related to the perceptions of CCS practitioners, attempting to understand the primary concerns of these actors according to their regional context. The article highlights the existing disconnect between public policy, the current state of understanding of the CCS and the industry actors, urging for greater research and policy-development to promote innovation and socioeconomic growth.

Keywords: knowledge transfer; cultural and creative sector; quadruple helix; innovation

1. Introduction

The last decades of the 21st century were marked by a transition in industrial models, particularly in Europe and in the United States of America. Market structures showed a decline of heavy industry, the rise of high-tech and digital products and a shift in the industrial organization of labour and human capital (Piore and Sabel 1984). The growing weight of the cultural content of commodities and services brought profound consequences to cities, regions and education systems (Caves 2002; Florida 2002, 2012; Landry 1995; Scott 2000, 2014). The growth of the cultural and creative sector (CCS)—understood broadly as activities that focus on the production, consumption and mobilization of cultural codes—led to a widespread political, social and economic recognition of the role of these actors, assuming the regional and local levels to be privileged sites of analysis of

such dynamics (Asheim et al. 2011; Moulert and Sekia 2003; Boix et al. 2012). Territorial links existing between the various CCS activities and its governance actors are crucial for the sustainability of these sectors (Camagni et al. 2004; Cooke and Lazzeretti 2008; Costa 2007; Scott 2000, 2014).

These changes also led to a strong focus on technological development and on innovation as a main driver of economic growth (Asheim et al. 2016), and to the recognition that Higher Education Institutions (HEI), as producers of knowledge and educators, also had a social role to play. This "third mission" focused, in great part, on the social and political participation of HEI in regional development, which soon became deeply associated with knowledge transfer (KT) mechanisms, often related to the commercialization of knowledge produced in these institutions, where research contracts, patents, and spin-offs played a crucial role in the policy perspective (Pinto 2012). The successes met by many of these actions in the domain of KT led to its spread to many scientific areas, although the focus continued to be on technical-knowledge intensive fields such as bio and nanotechnology, pharmacology, and computer science (Crossick 2006).

Seeing the temporal convergence of these two trends, one might expect to see in the political and academic literature a greater concern with the innovation dynamics of the CCS and the necessary KT processes. This does not, for the most part, seem to be case: for the majority of the cultural and creative subsectors, firms and actors participating have remained distant from the university, having sparse or moderate contact with them and few active collaborations (Heidemann Lassen et al. 2018; Zukauskaite 2012). The higher education institutions in turn appear to have also few active engagements with the sector in a way that takes into account its many specificities (Comunian et al. 2015; Hearn et al. 2004). This raises the question of what motivates this lack of engagement, especially in light of the political discourse existing around both KT policy and the CCS.

Conceptual models such as the "National or Regional Innovation Systems" (Asheim et al. 2016; Cooke 2001; Lundvall 2007), as well as the Triple Helix (Etzkowitz and Leydesdorff 1997, 2000; Ranga and Etzkowitz 2013) have in particular brought to light the need to consider the multiple kinds of actors involved in the processes of innovation. The latter model brought particular emphasis on the communicational interdependencies of industry, academic and governance actors in coordinating institutional forms, as well as providing an operational basis around which to organize knowledge policies (Leydesdorff and Etzkowitz 1998; Pinto 2017). The introduction of a fourth helix—the civil society and the media, with their social and cultural concerns—was first proposed by Carayannis and Campbell (2009), in order to incorporate domains that, like the CCS, relied heavily on the production of their own demand, and have direct social impacts on a regional scale. Such an approach has the particular advantage of giving greater emphasis to the role of public policy in enabling innovative practices, as well as considering the social and cultural value implications of innovation. The latter is made all the more relevant when one considers the importance of non-governmental organizations (NGO's) and associations in promoting culture and creativity across regions (Stadler and Fullagar 2016; Zbuchea and Leon 2015).

The goal of this article is thus to analyze policy on CCS with a focus on knowledge transfer practices encouraged and enabled by regional government actors. This stems from an understanding of the importance of public actors in promoting knowledge management and formal institutionalization of knowledge, especially when using "system integrators", a role which HEI may take on (Cacciatori et al. 2012). We analyze small and medium sized enterprises (SME's) of the CCS, chosen due to being the presumed target of KT policies—i.e., being in part motivated by profit and constituting a large part of the sector. We seek to specify some of the peculiarities noted in academic literature, in order to provide a frame of reference for the current state of policy debate in seven regions of the Atlantic Area: Lisbon Metropolitan Area (Portugal), Pays de la Loire and Bregtane (France), Andalucia and Asturias (Spain), Southwestern Scotland (United Kingdom), and Southern and Eastern Ireland (Ireland). This is done in order to understand in what way has policy been undertaken and to what extent it matched with the needs of local actors. This leads us to questions such as: What characteristics does the CCS have that leads to a lag in KT policy design? How has KT policy been promoted by public actors? How do CCS actors perceive the current state of engagement with HEI?

The article is organized as follows. In the next section it traces a brief overlook into some of the specificities of the CCS, underlining its specific concerns in terms of policy. In the third section the article focus the institutional and political organization of the CCS in each region, tracing a general profile that contrasts the discursive engagement of the regions and their political commitments, through content analysis of over 50 policy papers and reports. In section four, broad lines of intervention are identified, suggested by innovation policy and academic research on the CCS. Then, the article presents contrasts between individual perceptions and political engagements. Finally, some notes on future research are presented.

2. The Cultural and Creative Sector: Some Specificities

2.1. Cultural and Creative Sector Definition

The precise definition of "cultural industry" or "cultural sector" is an open and nearly endless debate in political and academic terms, with little in the way of consensus (Cruz 2016; UNCTAD 2008): whether to give priority to the digital and technologic sector, the performance and fine arts, or even the inclusion of sectors such as tourism and heritage, tends to change in regional and temporal terms (Mateus 2010). Abstaining from such a debate, for the article purposes we consider the sectors noted in Table 1—including some subsectors which do not normally figure in the idea of "industry", given its social and cultural actions. These subsectors were selected as an adaption from Cruz (2016), to reflect a broader understanding than generally understood within CCS research. This is in part due to the growth of sectors such as virtual reality, creative cooking, and others that are emerging as creative activities, as well as the need to have a more detailed understanding of the subsectors in question.

Table 1. Classification of Cultural and Creative Sector (CCS) According to Subsector.

Classification / Subsector	Cruz (2016)	Boix and Lazzeretti (2012)
	(Categorical Scale)	NACE Rev.2
Advertising	Advertising and related services	731
Architecture and Industrial Design	Architecture and engineering	711
Designer fashion	Fashion	14; 1511; 152
Video, audio, Film	Film and Video Industries	591
Music	Music and Musical Studies	182; 592
Photography	Photography	742
Graphic design	Graphic Arts and Design	181
Writing and Publishing	Performance Arts and Writers Publishing	581; 90
Dance/Ballet	Performance Arts and Writers	90
Theatre	Performance Arts and Writers	
Orchestras/Music Conservatories	Performance Arts and Writers	
Broadcasting (TV/radio)	Radio and Television	601; 602
Apps development	Software, videogames, and digital editing	5821; 5829; 6201; 6202
Digital Arts	Software, videogames, and digital editing	

Social Media and Influencers	Software, videogames, and digital editing	
Gaming/Animation	Software, videogames, and digital editing	
Virtual Reality	Software, videogames, and digital editing Interactive Media	
Web Design, Multimedia, Transmedia	Specialised Design Services Interactive media	741
Fine Arts, Antiques, Sculpture	Fine arts and antiques, Other Visual Arts (Painting and Sculpture)	4779; 90
Others	Cultural Tourism and recreation Intellectual property Agencies	93
Museums and galleries	Heritage and Cultural Places	91
Crafts	Crafts; Jewellery	90; 321; 32Mu2; 324
Creative Cooking	(N/I)	----
Events/Festivals	(N/I)	----
Tech Devices	(N/I)	----

Source: Own elaboration, based on Cruz (2016).

As noted, the CCS is distinct from other sectors first and foremost through its use of cultural and socio-cognitive content to a much greater extent than traditional industries, especially in a territorially embedded manner—by forming the so-called creative *millieux* and similar types of territorial agglomeration (Camagni et al. 2004; Costa 2013; Kebir et al. 2017). However, such a fact is more a consequence than a cause of their peculiarities. Three aspects are key to have a good understanding the differences of the sector, which lead to the relative lack of specific KT policies: organizational and entrepreneurial structure, motivations and innovation, and connections with HEI.

2.2. Organizational and Entrepreneurial Structure in the Cultural and Creative Sector

Regardless of the specific subsectors, the CCS is characterized by small and micro enterprises, individual actors (Hearn et al. 2004) as well as numerous NGO's and local associations (Dovey et al. 2016; Seixas and Costa 2011), with many being connected only through specific projects rather than stable work relations (Caves 2002; Scott 2000). Internationally, this trend is widely recognized (AURAN 2014; CS 2017a; CCT 2017; Indecon 2011; RB 2013; Sánchez and Vega 2014), and leads to several issues when considering questions of internationalisation of goods (Mateus and Associados 2013). Moreover, it also poses issues related to IP and the mobilization of knowledge, especially in what respects cultural associations and micro-companies (Dovey et al. 2016).

Such a factor ties directly to the informal and territorially bounded nature of the CCS in ways similar to other industries, such as manufacturing and high-technology industries (cf. Boschma 2005; Lopes 2001), but with specific consequences on the level of product and service commercialization (Holden 2015). Many of these companies exhibit styles of entrepreneurial management heavily dependent on a "charismatic leader", who guides the company towards a specific "vision", with market sustainability plans being sometimes replaced by mechanisms of demand creation (Comunian et al. 2014; Heidemann Lassen et al. 2018; Zukauskaite 2012). Such informal ties tend in fact to influence the way that information circulates in such creative *millieux*, leading symbolic and reputational-based knowledge to play a bigger role than formalized knowledge (Costa et al. 2011). Many of these actors lack entrepreneurial and business training, increasing the difficulty in managing

market interactions (Comunian et al. 2015; Heidemann Lassen et al. 2018; Mateus and Associados 2013). This happens in part because business models and motivations, which can go beyond the economic, are not duly recognized support structures, such as incubators and similar bodies (Hearn et al. 2004; Zukauskaite 2012). Finally, the very issues of lack of knowledge in production has been identified as a source of difficulty for the development of small and medium-sized companies (Comunian et al. 2015).

2.3. Motivations and Innovation in the Cultural and Creative Sector

Innovation produced within the CCS transcends the economic aspects, dominant in other sectors. It is often social (satisfying the need of a reference group) and cultural (formulating a shift in an established narrative and contributing to a discussion in a cultural context) (McKelvey and Lassen 2018). This creates many challenges to KT policy—how to archive product innovation? What plays the role and counts as R&D in the CCS? How should changes in organizational structure be understood? As noted in the debate about "hidden innovation" happening in the CCS (Miles and Green 2008), these different kinds of innovation pose a challenge in terms of how to evaluate the impact, sustainability and goals of a specific project and/or actor in its multiple dimensions—something which can only be properly conducted through a detailed understanding of the social fabric at hand.

In parallel, these different kinds of innovation are intimately connected with different motivations underlying firms: as noted by Bruno Frey (Frey 1997) amongst others (Hutter and Throsby 2011; Throsby 1994, 2006), individual motivations cannot be reduced to the economic sphere, under penalty of reducing the production of new products and services. Given what we noted about "charismatic leaders" playing a role in the CCS, this seems intuitive: individuals produce goods and services to express a given "vision", often without knowledge or concern of whether it will be economic viable.

Matters are further complicated if we note that companies use different combinations of knowledge bases (Asheim and Hansen 2009), by mobilizing not only symbolic knowledge—whereby products and services are imbued with a semiotic code that is then received in different ways—but also technical and analytical (i.e., scientific) knowledge, in addition to requiring the practical and scientific knowledge associated with business management.

Recognizing the different motivations and types of knowledge, and the kinds of value produced—not only economic, but also cultural and social, and how to measure such forms of value—is yet another challenge for CCS policy which needs to be addressed in developing effective KT mechanisms, and one which would fundamentally benefit from conceiving of such mechanisms multilaterally: engaging CCS actors with social and economic motivations to focus on the cultural aspects, promoting social value within economically driven companies, as well as bringing symbolic knowledge to HEI (Crossick 2006).

2.4. Connections of the Cultural and Creative Sector with Higher Education Institutions

Owing to the above stated factors—small size, a specifically informal and leader-oriented ethos, distinct forms of value creation and motivations—we can note that there exists a relative disconnection between HEI and the CCS. Linkages can include not only co-involvement in associations, participation in incubators, spin-offs, collaboration in patents, designs or trademarks, as well as more simple forms of engagement such as co-participation in activities or development of joint projects (Pinto 2012). Furthermore, other forms of connection which can be considered—as they have synergistic effects with the former—include collaboration on the level of shared staff, the existence of CCS workers and participants with higher education degree, amongst others (Comunian et al. 2014; Heidemann Lassen et al. 2018; Zukauskaite 2012).

Given their small size and high levels of education among practitioners (McKelvey and Lassen 2018), it would perhaps be expected that CCS could have intense relations with HEI, potentially marked by physical proximities. Despite this being true in some specific subsectors (Zukauskaite 2012), for the most part the HEI and CCS have remained relatively distant. Authors such as Roberta

Comunian (Comunian et al. 2014, 2015) have proposed that this can stem from both institutional and individual dispositions: lack of engagement of academics in artistic and creative practice, and conversely, the lack of artists and practitioners in teaching, research and support functions in HEI; lack of an understanding within HEI of the above stated specificities of CCS, taking them to be similar to other industries, and providing them with generalist solutions; connected to this, the lack of proper professionalization of students, not providing them with sufficiently realistic understanding of CCS markets; and finally, difficulties in establishing longstanding bonds to promote career opportunities amongst graduates. This has been corroborated and expanded by other authors: questions of the precarity of labour in the creative industries, which make engagement with HEI difficult (Kimpeler and Georgieff 2009), as well as the lack of a clear understanding of the benefits of collaboration (Crossick 2006), further widen the gap between HEI and the CCS.

All of these issues together paint a collective picture of why KT policy has remained difficult in the CCS: the small, informal and territorially bounded nature of actors, together with their distinct motivations, innovation types and value-creation, have remained for the most part separated from the actions of HEI. This has led to the latter promoting overtly general policies that do not fit the business models and goals of CCS actors. However, such a statement can only be a hypothesis: we postulate that this may be the case, but still need to analyze the institutional contexts which lead to it, and understand what specifically has been accomplished and what is desired by CCS actors.

3. Policy on Cultural and Creative Industries

3.1. Institutional and Political Outline of the Selected Atlantic Regions

To advance in our analysis we selected seven European regions in the Atlantic Area,[1] and analyzed a number of qualitative dimensions related to the institutional context and policy actions undertaken by public actors regarding KT practices of HEI. This was done in part through looking into what the administrative bodies in charge of the CCS in each country and region are, as well through a qualitative analysis of 55 documents, including policy papers, scientific articles, and technical reports, analyzed under a general common framework. This analysis was done through classical content analysis, focusing on four dimensions: the **availability of** statistical and qualitative **information** in each region; the specific **focus** of the **actions** undertaken by the CCS, as well as in what regional scale the administrative bodies lay; what the **priorities** and **objectives**, as well as concrete actions undertaken to promote the CCS, with particular emphasis in what comprises knowledge relations; and synergies between universities and CCS outlined. Documents analyzed were selected on the basis of the scope and breadth of information contained, so as to capture the more relevant guidelines of each region. The documents span from 2007 to 2017, with the majority (24) being strategic documents and reports, with the rest being official policy papers and guidelines (20) and academic research into public policy (7)—see Table A1 in Appendix A. The presence or absence of an indicator was identified by the existence of explicit mention of the indicator in an appropriate document: for instance "Nationally recognized as a relevant focus of policy" meaning that the CCS appears mentioned as a strategic focus in a national-wide document. One thing that we can notice is that the regions seem to share a sort of grading—and though a typological assessment of such a limited number of cases can be somewhat abusive, we can, to make the analysis simpler, speak of the Iberian Regions (Andalucia, Lisbon Metropolitan Area—LMA—and Asturias), the French Regions (Pays de la Loire, Bretagne) and the Insular Regions (Ireland and Scotland) as having more in common with each other than they do with others, with few exceptions (notably, the organizational structure of Bretagne is somewhat closer to the Insular case). We will admit such a

[1] The Atlantic Area is defined by the INTERREG 2014–2020 cooperation program as including 36 regions from France, Ireland, Portugal, Spain, and the United Kingdom. It comprises a set of regions that are politically, socially, and culturally widely diverse, and having in common their proximity to the Atlantic Ocean.

provisional typology, which was supported by a statistical analysis[2] seems also consistent with socioeconomic typologies of regions such as the social systems of innovation and production (Carrincazeaux and Gaschet 2015).

In all analyzed regions, we could find a discursive concern with the CCS and industries: this could be seen in many studies commissioned on the state of the sector, as well as in media representations.[3] Such a concern could be found namely in the Smart Specialization Strategies (RIS3)—regional documents outlining the general strategic guidelines in each European Region, with a focus in increasing knowledge and innovation—where the CCS was, in all cases, included as a priority domain. However, in some of the documents surveyed it was noticed a double recognition, both that the discursive concern was a political goal in and of itself, and that it might be overly optimistic. Namely, in Lisbon, we see authors of a study on the creativity of the LMA saying:

> *"Despite the concentration of employment [in the CCS] in the Lisbon and Tagus Valley area, the global [economic] weight of the creative sector is still quite modest in face of the discourse produced on its relevance in regional and urban economic terms"* (André and Vale 2012)

Similarly, in the Spanish plan for the promotion of the cultural and creative industries, after recognizing that the sector found itself in a moment of expansion, which should be followed through, there appears to be an appeal to moderation, noting some of the debilities of the sector:

> *"The cultural sector is still in an initial phase in what refers to its structuring. The lack of entrepreneurial networks, lack of communication, and, as a consequence of that, the lack of collaboration between these actors continue to be realities"* (MECD 2016)

These two examples find similar echoes in Asturias and Pays de la Loire, where similar notes on the challenges still faced by the CCS can be found (AURAN 2014; CCT 2017).

In the other three regions, however, though it might be due to the limited information available, no similar accounts could be found. As we will see, coupled with the transregional commonality that nearly none of the documents analyzed made use of actor perceptions, this phenomenon can point out an important separation between the instances of governance, HEI and the actors involved in the CCS. The general summary of results can be found in Table 2.

Zooming in on the three groups of regions, Iberian regions have had a relatively uncohesive policy structure—in the case of Portugal and Spain, and Lisbon and Andalucía in particular, such concerns began late, into the late 2000s, and were deeply affected by the changes in prioritizing Culture following the economic crisis. Furthermore, in none of the three regions, we find dedicated statistical data specific to the CCS, with Andalucía compiling data on "cultural activities" which do not neatly map into any existent classification. Whilst the CCS is noted as an important part of economic policy, this is noted in the reports and surveys as translating into few mechanisms of support (MEGALOCI 2014; Sánchez and Vega 2014). In terms of the connections with HEI and the knowledge needs, the lack of greater capacity in terms of entrepreneurial activity is clearly outlined, as it is the lack of technical skills and sectoral meetings. There are no suggestions to the role that HEI should take in this.

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[2] We do not include a proper treatment of this statistical analysis given our focus is mostly on the political implications. Table A2 summarizes such measures can be found in the Appendix A.

[3] Such representations were not analyzed in the context of this research, although a proper treatment of them could perhaps give us a clearer notion of the political status attributed to the discourse on CCI, as well as a better grasp of the party-political implications of such discussions, cf. Lee (2016).

Table 2. Regional Policy towards the CCS and Knowledge Transfer in CCS.

		Lisbon	Andalucia	Asturias	Pays de la Loire	Bretagne	South-Western Scotland	Southern and Eastern Ireland
Statistical Information	Specific CCS category in Statistics Offices	x	Yes	x	Yes	Yes	Yes	Yes
	Dedicated Statistical Reports	Yes	x	x	x	x	Yes	Yes
	Existence of comparative data	Yes	Yes	x	x	x	Yes	x
Policy Focus	Nationally recognized as relevant focus of policy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Policy under National Tutelage	Yes	Yes	Yes	x	x	Yes	Yes
	Policy under Regional Tutelage	x	x	x	Yes	Yes	x	x
	Existence of autonomous governing body	x	x	x	x	Yes	Yes	Yes
	Regionally recognized as relevant focus (RIS-3)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Goals and Policies	Synergies with other sectors	Yes	Yes	x	Yes	Yes	Yes	Yes
	Promoting clusterisation	Yes	x	x	Yes	x	Yes	Yes
	Opening of FabLabs/Incubators/Accelerators/Technopoles	Yes	x	x	Yes	x	Yes	Yes
	Increasing tourism and heritage preservation	Yes	Yes	x	x	Yes	Yes	Yes
	Creation of Dedicated Funding Mechanisms	x	x	x	Yes	x	Yes	x
	Implementing Creativity in Adjacent Sectors (i.e., Learning, Management, etc.)	x	x	x	x	x	Yes	x
Links to Universities and Sectors	Promotion of Entrepreneurship in CCS	x	x	x	Yes	Yes	Yes	x
	Establishment of Explicit Connections between Academia with CCS small and medium sized enterprises (SME's)	x	x	x	Yes	Yes	Yes	Yes
	Creation of Dedicated KTV Mechanisms for CCS	x	x	x	x	x	x	x
	Establishment of Inter-Subsectoral Platforms	x	x	x	x	Yes	Yes	Yes
	Co-Location of CCS Development Agencies and Universities	Yes	Yes	x	Yes	Yes	Yes	Yes
	Involvement of Sectorial Partners in Policymaking	x	x	x	x	x	x	x

Source: Own elaboration, based on policy review (IDEPA 2014; CCT 2009; Muñoz 2012; FMPAA 2013; RB 2011, 2013, 2014, 2017, 2018; Cunningham et al. 2015; DKM Economic Consultants 2009; Harvey

2016; EGFSN 2017; CI 2017; CCDR-LVT 2015; GANEC 2014; ICS-UL 2014; MEGALOCI 2014; Costa et al. 2017; Costa and Lopes 2013; RPL 2008, 2014, 2017; CS 2012, 2013, 2014b, 2014a, 2014c, 2015, 2016, 2017a, 2017b; Million+ 2008; US 2011; SAC 2009, 2016; Aguiar Losada 2014; IECA 2016; OECD 2010; FAMP 2010; MECD 2016, 2017; CCT 2017; Indecon 2011; Mateus and Associados 2013; Mateus 2010; André and Vale 2012; Cruz 2016; Costa et al. 2011; AURAN 2014; Sánchez and Vega 2014).

The French case is characterized by a strong bet in technopoles and professional associations as mediators of CCS, government and HEI. Having relatively solid associative tradition, especially tied to sectors where the French economy is historically strong, namely fashion and fine arts (AURAN 2014), there is a concern with the turn towards the digital arts that has been experienced in the last few years. Furthermore, the recognition of the importance of CCS has shown through its incorporation as a specific domain of statistical analysis, although we could not properly assess how this has translated into an actual mobilization of the data produced in the regional observatories. Also relevant is the management system undertaken by these regions—with the Regional RIS3, both of Bretagne (RB 2013) and Pays de la Loire (RPL 2014), placing emphasis on regional management which seems to be the responsibility both of municipalities and regional organizations, as well as the State, in an alternating and sometimes overlapping manner. Finally, in terms of connections with HEI, both regions recognize the need to involve agents of the sector as one of the main issues pressing the CCS, and note the need to promote entrepreneurship, professionalize students, and recognize the diversity of outputs of the sector—albeit this not translating into concrete policy.

The insular case—despite the notable differences in duration and extension of policies in Ireland and Scotland, namely in terms of the connections with HEI—is particularly marked by the existence of support organizations with hierarchical autonomy in face of the bureaucratic structure of governments. In that sense, it is more flexible in designing plans and exhibiting greater alignment with the national policy than with local actions. These regions have adopted many CCS activities as relevant, and have a specialization logic particularly in the digital and videogame industry (Ireland) and the traditional cultural sectors (Scotland). Many of the reports reflect the needs of the industry, government, and education agents and incorporate them in policy design—though not in an extensive manner. Nonetheless, this status does not lead actors to not recognize the paths that should still be taken, both in strengthening the associative fabric, involving members of the public and end-users, to include more than economic concerns, as well as promoting greater connections between the CCS and HEI. More specifically, the articulation between management institutions (Creative Scotland and Creative Ireland), the associative fabric and HEI appear as two key issues to be tackled on a medium term.

In a simplified fashion, we can underline some of the priorities and ways that seem to be pointed out by the previous discussion. Such aspects stem from both recognizing the gaps in policy undertaken in regional contexts and by framing the needs of CCS as being explicitly relevant to the development of such policy, namely through incentives to HEI (Comunian et al. 2015; Dovey et al. 2016; Kimpeler and Georgieff 2009; McKelvey and Lassen 2018; Miles and Green 2008):

1. the intra and intersectoral communication flaws that appear in the Iberian Regions, coupled with debilities in terms of strategic decision, lack of data and difficulties in specifying the most important sectors, all contribute to demand a greater stimulus towards entrepreneurship and to mobilize HEI to take on the role of sectoral mediators.
2. besides questions of management and power organization, in the French regions, the increments to the digital sector, as a complement to the strict connection with more "classical" cultural sectors, appears as a relevant form of intervention, alongside the design of policies that involve stakeholders and strengthen the already present associative logics.
3. focus on cultural sectors, alongside already extant professionalization policies in the insular regions. Besides that, the collaboration between all regions on a transnational basis allows the exchange of practices and human resources, in order to promote a more balanced territorial development.

We can then briefly sketch a model for three lines of action in terms of the policy design, which we will explore in turn. One should bear in mind that the specifics of how these are implemented cannot be given here, as they tie to the entirety of the regional systems and the political issues just discussed. Nonetheless, we can present what kinds of practices seem necessary to encourage within KT policy, namely in providing incentives for HEI: promoting direct knowledge transfer, in terms of skills and technology exchange; promoting sectoral collaboration with HEI serving as mediator; and promoting knowledge multilateral engagements.

3.2. Bilateral Flows from HEI to the CCS

The first line of intervention we identified is perhaps the closest to the strict sense idea of KT: transferring skills and promoting the exchange of information, not only on a one-sided manner, but through bilateral engagements. This essentially amounts to aspects such as:

1. **Promoting an entrepreneurial spirit**: mobilizing technical knowledge important to the CCS, in terms of management, accounting and finance, but also in line with the reality of micro and small enterprises, where product volatility implies little time to access deeply theoretical and analytical knowledge. This amounts for instance in the development of tailored business training for small sized CCI companies, hosted by HEI. Such an action would make most sense in regions such as Portugal or Spain where the greatest challenges in managing company trajectories are felt (CCDR-LVT 2015; JA 2015; Mateus 2010; Mateus and Associados 2013; Sánchez and Vega 2014). Moreover, this could be further implemented by taking into account the need to understand the business and organizational mechanisms of the CCS as such—as pointed out by many authors (Comunian et al. 2014; McKelvey and Lassen 2018; Miles and Green 2008; Zukauskaite 2012).
2. **Development of Market Knowledge in CSS**: similarly, knowledge produced by HEI with importance to the action of CCS—such as consumer trends, appreciation of products, as well as transfers of symbolic and aesthetic knowledge, should be encouraged by policy to be done in a way that complements the engagements of actors, that is, by making it relevant and productive to their future actions, whether commercial or social/cultural oriented. Going even further, by adopting a quadruple helix approach, HEI could be seen as key actors in connecting the CCS with the needs and desires of the public, whether through social research or through *big data* analysis and similar data processing frameworks which can give advantages to micro and small enterprises, who often find such systems prohibitively expensive. Another option here lies in the development of tailored curricula designed for actors of the CCS to undertake.
3. **Mediating CCS subsectors**: due to the subsectorially closed nature of the CCS, innovation can have difficulty diffusing (regardless of its nature). Moreover, as noted, issues of persistence of knowledge and existence of knowledge management mechanisms (Crossick 2006; Dovey et al. 2016; Miles and Green 2008; Wijngaarden et al. 2016) have a lot of relevance, with studies pointing to the advantage of having system integrators (Cacciatori et al. 2012). In that light, HEI should be encouraged to take on an active role in promoting such engagements by intervening through practical experience exchange and promotion of in-sector collaborative projects: workshops, joint projects, meetings and similar actions. Whilst in many cases this role is already undertaken, giving greater emphasis to it should benefit two kinds of regions: those, such as the Iberian selected regions that have a weak associative tissue, and those such as the French regions which exhibit a strong associative tissue but few connections to HEI. Naturally, such network structures will not be equally advantageous to all sectors, but they should be able to promote connections between territorially bound and internationally bound actors.
4. **Creation of Spaces of Exchange**: as further noted, part of the CCS requires some flexibility in its engagement, and as such, would ideally benefit from having actors which simultaneously act within HEI. The promotion of spaces of exchange should then be made into a way to formalize the previous point. Such spaces could bring further advantages if they were managed by individuals involved in the intersection between the academia and the industry—who were

practicing academics, and vice-versa—which can imply the need to create incentives amongst HEI to, at least, remove some obstacles to collaboration (Comunian et al. 2015).

3.3. Flows within Higher Education Institutions

Whilst the former approach lies in fostering HEI to engage bilaterally with the CCS, it is also recognized that part of the innovation policy lies in promoting KT practices within HEI. This involves the kinds of actions which HEI must promote internally: in management terms, specific priorities can be recognized and adapted, depending on the HEI local context, such as providing more digital skills, establishing greater contact with local companies, amongst other options which are common to other industrial contexts (Asheim et al. 2016; Boschma 2005) but which in the CCS take specific contours given the nature of knowledge involved (Miles and Green 2008). More so, the focus should be on presenting students with a vast array of options, both promoting more social and cultural inclinations to those CCS activities that tend to take a more economic oriented vision (such as the majority of advertising and digital companies), and vice-versa (such as the fine arts, and in general the cultural sectors) (Crossick 2006; Comunian et al. 2015). Similar benefits could be obtained from developing 'hybrid' programs, such as mixed PhD's between firms and academia or collaborative engagements (Crossick 2006), bachelors' internships within CCS firms, in particular the small-sized companies.

The traditional focus on patents, designs, brands and spin-offs can still be retained, as long as it is properly situated to the reality of the informal, leadership-driven and territorially bounded nature of the CCS. The creation of dedicated programs that target the CCS specifically, as well as specific mechanisms of KT that are able to fit the fluid nature of its services, social value orientation of many of the products delivered, can allow HEI to attract different individuals, namely students, with a myriad of motivations (Comunian et al. 2014).

Such actions seem to make particular sense in those regions that already have well-established connections, and a well-defined role, for the CCS, such as the insular regions. Flexible institutionalization grids, which are not commonly found in institutional, financial and regulation frameworks which guide the action of the HEI, is a fundamental requisite for such actions.

4. Cultural and Creative Actors' Perspectives on Knowledge Transfer

4.1. Methodological Notes

From the previous section we could begin to see that there appear to be some relationships between the institutional contexts of the regions, the types of policies undertaken and those in need to be undertaken in each territorial framework. In order to justify that this indeed relates to a lack of engagement from political and institutional actors, and that the lines of intervention previously outlined correspond to the needs of some subsectors of the CCS, it is necessary to understand the perspectives of CCS firms regarding knowledge transfer. In particular, we sought to assess how actors characterized their current relationships with HEI, what types of knowledge they saw as most necessary, and what kinds of weaknesses they identified in the current way that KT is undertaken in relation to them. Whilst our goal with this was to understand the relationship between policy and the HEI-CCS relationships, this was not analyzed directly[4], opting instead to focus on the former three aspects.

These results are based on a survey undertaken to a total of 130 small and medium sized companies of the CCS, although 8 responses (which comprised all the answers from Ireland and Bretagne—leading to their absence from the discussion below) were not considered due to completeness. The companies chosen on the basis of their territorial basis (operating within the

[4] Rather than asking respondents directly about the role of policy frameworks—which initial tests showed most of them have difficulty answering—we assume here that when actors point to similar weaknesses as those we identified in the previous section regarding different regions, this reflects more the underlying political structure, than the HEI's lack of proactivity. However, results should be interpreted with care in light of this.

region), and their size, with the survey being self-administered online, and having a 3% response rate.

The survey focused three key topics. The first was the main forms of collaboration carried out between CCS actors and HEI. Here aspects such as shared human resources, participation in workshops, joint projects, location, or incubation in HEI or related institution, training in HEI, shared industrial property rights, or participation in sectoral meetings were considered. The second, regarded the types of knowledge that CCS actors wish to receive from HEI. This regarded technical, sociocultural, business and aesthetic knowledge. The third topic pays attention to weaknesses that CCS actors identify in the current action of HEI, such as difficulty in understanding Research results, lack of professionalization of students, meetings and associations, investment in collaborative projects, or lack of hosting spaces.

4.2. Main Results

In this sub-section we present the main descriptive results concerning the three dimensions considered. The perception of actors regarding the connections of the CCB to HEI (Table 3) shows that firms in the Iberian regions (n = 68) compare to total sample average present higher levels of shared human resources (HR), joint projects and higher levels of individuals who contribute to training courses organized by HEI. Both Andalucia and Asturias claim higher levels of participation in workshops, participation in sector relevant meetings. More so, whilst in Asturias and the Lisbon actors fit in with the general case in terms of being hosted in HEI, Andalucia has almost double the general figure.

Looking at the regional data available for French regions, only Pays de la Loire (n = 23), we see that the regional firms perspective falls very much in line with the average of the other regions under study, with two important exceptions: a greater number of workshop participations as well as a much higher number of companies hosted in HEI. This seems to fall in line with the policy review, as it would make sense that the professional organizations existing would to a certain extent be tied to universities, and thus that many actors would be hosted in them.

As for the Scottish case two aspects should be noted. A quick look comparing this to other regions shows that these questions had a substantially higher non-response rate in Scotland (only 12 valid cases), which leads to few responses, and thus, to extreme values. Whilst we may offer the possibility that the non-response by itself shows that KT is a much lower concern in CCS firms, due to it being more present, for this region than it is for the others we have been studying, such an interpretation would be abusive. We will thus proceed to analyze the data, despite noticing that even in the domain of purely indicative descriptive statistics this case should be seen as less reliable than the others. In terms of connections to HEI that actors claim a much lower percentage of engagement with the institutions, with no actors claiming shared HR, contributions to training or hosting in an organization. However, participation in sector-wide meetings seems to be higher than the average of the other countries, as is the percentage of shared patents and trademarks.

In terms of knowledge needs (Figure 1), both Lisbon and Andalucia have a higher percentage of individuals claiming the need for technical and business knowledge compared to Asturias and the general average. Notably, a substantial number of actors in Lisbon also points out the need for sociocultural and aesthetic knowledge, however—nearly 60% of all respondents refer this for both kinds of knowledge. This seems to indicate that these actors see aesthetic, cultural, and social engagements as necessary for their activity and for their action, and thus might require not only managerial inputs but also more diverse forms of engagement from the part of HEI.

Table 3. Connections to Higher Education Institutions (HEI).

Type of Connections	All Countries	Iberian Regions			French Regions	Insular Regions
		Lisbon	Andalucia	Asturias	Pays de la Loire	Scotland
Shared HR	10.5%	25.0%	13.0%	14.3%	8.7%	0.0%
Joint Projects	42.9%	70.8%	73.9%	57.1%	39.1%	16.7%
Participation in Workshops	35.3%	33.3%	56.5%	57.1%	47.8%	11.1%
Hosted in HEI	22.6%	20.8%	39.1%	19.0%	47.8%	0.0%
Participation in Sector-Relevant Meetings	43.6%	37.5%	78.3%	71.4%	43.5%	50.0%
Contributed to Training Courses	24.1%	29.2%	52.2%	33.3%	21.7%	0.0%
Shared Patents/TM/Design	7.5%	4.2%	17.4%	9.5%	8.7%	16.7%

Source: Own elaboration.

Two things strike us as relevant in the French case: on the one hand, compared to the general value of 50% of actors claiming the need for business knowledge, the region has more than 70% of actors with a similar opinion; and there is a higher number of actors claiming needs in terms of sociocultural knowledge, access to user and citizen opinions, etc.

In terms of knowledge needs, the Scottish case is very much atypical in that their actors identify the lack of technical knowledge as well as sociocultural, in levels on par with the regional average, but see no need in aesthetic or business knowledge. Whilst the latter could be interpreted as a success on the part of regional entrepreneurship policy, the former could imply that actors take a clear separation of HEI from the creative activities themselves, or that they maintain highly individualized views on creators—the data is insufficient to come to such conclusions.

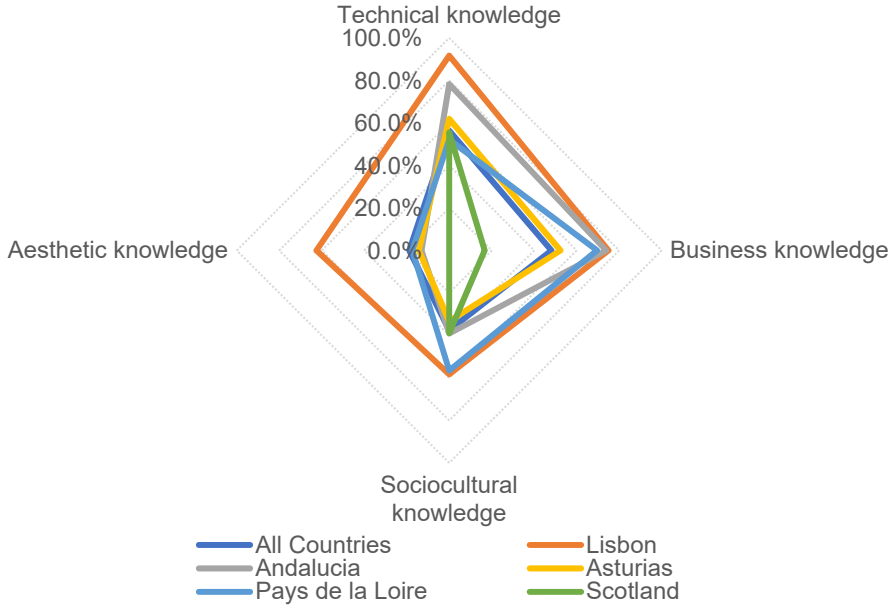

Figure 1. Knowledge Needs. Source: Own elaboration.

In terms of weaknesses identified with the current HEI transfer policies (Figure 2), the major differences are that, in general, Iberian regions identify more difficulties in understanding and accessing research results, and see a greater need for sector wide meetings. This is particularly true for Lisbon, where in addition to this the lack of hosting spaces is identified by more than 60% of actors and Andalucia, where nearly all (95%) of the actors in Andalucia see the lack of joint projects between CCS and HEI as one of the major flaws in the KT policy, as do around 70% of the actors in Asturias.

The actors in Pays de la Loire do not seem to have difficulties in accessing and understanding research results and do not see the lack of meetings and associations as very relevant, whilst in turn they stress the need to professionalize students overall. They also see the lack of investment in joint projects as a higher priority than other regions. Given this figure, we confirm that the policy review captured the overall perceptions of the region. The need to professionalize the CCS entrepreneurs, and to imbue them with a clearer understanding of the meaning of these practices, appears both in Pays de la Loire and Bretagne to have much to do with the specific subsectors under question.

Finally, in terms of weaknesses identified, Scotland again more atypical, in that actors do not see most of the topics noted by the other regions as serious issues—with professionalization of students entirely missing, difficulties in communication, lack of investment in projects and of meetings and associations well below the average. The only aspect in which they seem to be closer to the average of the regions is the lack of hosting spaces, to which more than 20% of actors allude. Despite the insufficiency of the data, this result would go in line with initial expectations: it would make sense that having a longer experience in managing policy the needs identified would be substantially different from those experienced in countries which have only recently begun their CCS policies and which have very different institutional, political, and economic backgrounds.

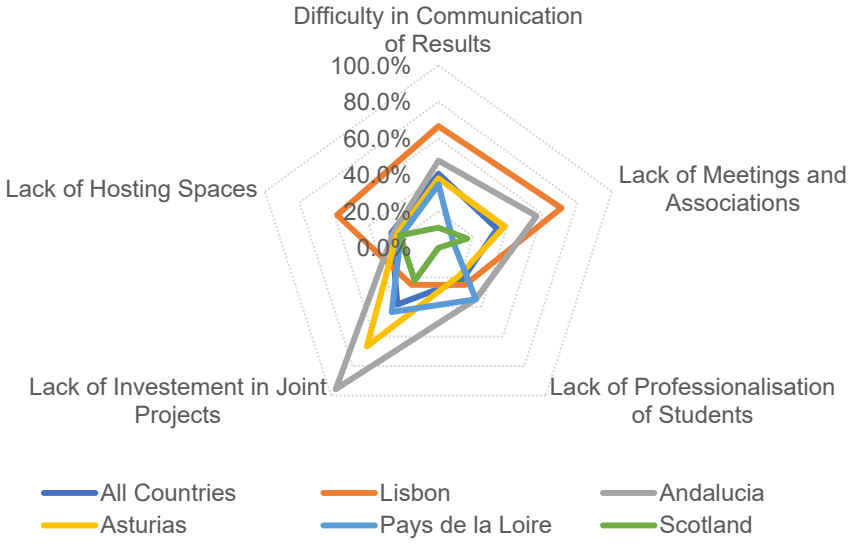

Figure 2. Weaknesses in HEI KT. Source: Own elaboration.

Naturally, such a discussion is not consistent amongst subsectors, and these play an important role in distinguishing between the perspectives about HEI policy. Focusing specifically on the knowledge needs and the connections to HEI, from the latter we see, in Table 4, that most of the sectors with a more distinctly cultural nature—such as video, film, performance arts and publishing—have a greater engagement with HEI in terms of joint projects when compared to others. In turn, design, video and audio seem to be particularly likely to be hosted in HEI. Advertising stands out as being relatively isolated in terms of connection with HEI in terms of workshops and meetings.

Table 4. Connections to HEI According to Subsector.

Type of Connection	Advertising	Video Games, Audio, Video, Film	Graphic, Web, Transmedia Design	Others	Fine Arts and Crafts	Performance Arts, Writing and Publishing
Shared HR	18%	10%	12%	13%	0%	0%
Joint Projects	27%	48%	41%	47%	30%	50%
Participation in Workshops	36%	45%	24%	40%	35%	10%
Hosted in HEI	18%	30%	29%	7%	10%	10%
Participation in Sector-Relevant Meetings	18%	50%	47%	53%	30%	40%
Contributed to Training Courses	9%	33%	26%	27%	20%	0%
Shared Patents/TM/ Design	9%	5%	9%	13%	10%	0%

Source: Own elaboration.

These results are in turn consistent with the weaknesses perceived (Figure 3): sectors with a more business orientation (such as advertising) see the main issues being about connecting with the rest of the CCS; the fine arts and crafts, with a more cultural motivation, in turn see the need to have more joint projects and engagement with the HEI, in sharing human and material resources. The performance arts, graphic and media, web design and other sectors such as event programming or tourism, see the main issue being the difficulty in understanding knowledge produced in the HEI. This paints a picture that becomes even more complex: policy about the creative industries should take into account these wild disparities in needs, and as far as possible target them specifically.

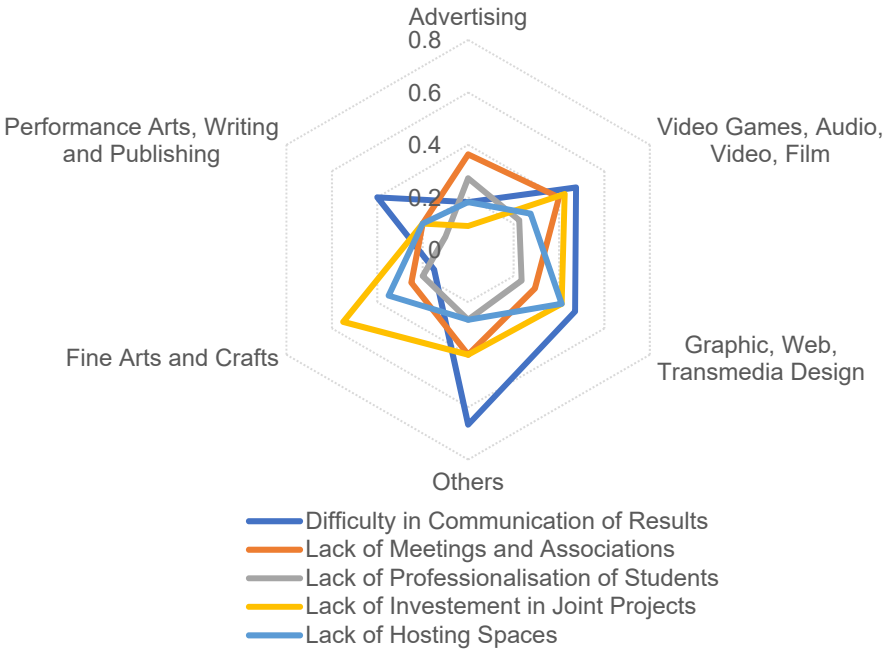

Figure 3. Weaknesses Perceived by Different Subsectors.

From the previous discussion we can quickly gather that the relatively straightforward picture painted was not entirely out of touch with the actor perceptions—indeed, questions of professionalization and associative connection exist both in the Iberian and French regions, and the main weaknesses associated with the Iberian regions seem to lie in accessing technical and analytical, as well as business, knowledge. Moreover, company motivations are complex as multiple kinds of actors exist even within SME's of the CCS, possibly owing to differing motivations and goals.

This aspect ties to one of the key features of the previous discussion. How, in some locations which have a high recognition of the CCS as an important domain, their discourse can be at odds with the local actors. This is seen in the fact that many of the studies commissioned (JA 2015; CCT 2009; Mateus 2010; RB 2011; AURAN 2014) do not pay attention to the local actors. We would argue this is the a very crucial vector of quadruple helix engagement: an effective KT policy requires that actors can actively participate in the design of these measures. In great part, this also involves that one looks at the symbolic specificities of CCS activities, in order for the policy actions to have sustainable grounds (Costa 2015, 2007; Camagni et al. 2004; Kebir et al. 2017).

The previous contrast between institutional frameworks and actor perceptions seems to point out a need for more active quadruple helix engagements. Relations that go beyond the simple recognition of multiple kinds of actors. In that sense, our study helps to recognize the lines of action that still require much work in order to fit the political, social, economic and cultural goals for an effective quadruple helix in the CCS.

5. Conclusions

This article attempted an incursion into the intersection of Cultural and Creative Sector (CCS) and Higher Education Institutions (HEI) in a Quadruple Helix context. Such an incursion was done through a look into the present state of public and university policy on the subject—noting the lack of explicit policy models that address the relationship between HEI and the CCS sector, and attempting to propose guidelines grounded on the present understanding of the sector as well as the perception of the actors involved in it. This stems from a recognition of public actors as having a relevant role in mediating the relations of knowledge between HEI and industry sectors, and sought to analyze the extent of their action towards promoting them. Firstly, a literature review of relevant aspects of the CCS was presented. Secondly, a qualitative content analysis of reports and policy papers in select regions from the Atlantic was developed to provide a vision of the institutional emphasis in this relation. Finally, the perceptions of CCS firms in these territories, regarding crucial KT aspects were scrutinized based in a survey, emphasizing the geographic and sectorial aspects—and the need to consider the CCS down to the subsectors and the possible motivations that drive different actors. To operationalize the study, the regions analyzed (Pays de la Loire, Bretagne, Andalucia, Asturias, Southern and Eastern Ireland—albeit only in institutional terms—Southwestern Scotland, Lisbon Metropolitan Area) were also grouped in three typologies that share not only geographic but social and political commonalities: Iberian, Insular, and French Regions. The analysis revealed, with no major surprises, that the longer experience in these matters of Scotland, and to a lesser degree, Ireland, has led to these countries having more intensive development processes in their CCS, and that, by contrast, regions such as Lisbon and Andalucia, issues of KT policy within the sector have not had a clear translation in terms of policymaking. This is further attested by the larger percentage of actors in the latter regions who see the current models of knowledge transfer as being insufficient. Whilst this analysis leaves out many aspects which are important in assessing the success of the policies undertaken—such as the costs of such involvements, and the expected socioeconomic gains of such policy, it nonetheless shows that there persists a gap between the perceived needs of the CCS, owing to its specificities, and the political commitments undertaken to address them. As noted, however, this should be read with care in light of the lack of a proper treatment of the actions and institutional guidelines of HEI in the different regions, with these interpretations stemming only from a convergence between lack of institutional policy and actors' perceptions pointing in the same direction.

The three lines of intervention outlined—focusing both in bilateral flows from HEI to CCS, and in the internal flows of these types of actors—draw from a quadruple helix perspective the understanding that different actors generate innovation through their interrelations, and proposes broad mechanisms to promote them, although they seem far from sufficient. Our goal was to reframe the institutional debate, placing greater emphasis on the interrelations between actors and on multiple forms of value and knowledge—which the results hint is also perceived by regional actors as missing from social and regional policy. More detailed research into sectorial and regional specificities would need to be undertaken in order to allow for a more fine-grained understanding of the conditions and limitations faced by the sector in promoting multiple forms of innovation. Such an engagement is made all the more complex due to the diversity of the Cultural and Creative Sector, the fast-pace of its changes, as well as the heterogeneity of actors involved.

The policy lines suggested in this article seek to create deep connections between these two kinds of actors, namely through the HEI, taking on a mediational role, as well as having shared human resources. However, the public society act both as a source of knowledge and as an end-user for economic, social, and cultural goods. The framework presented puts greater emphasis on these aspects, by noting the different forms of value imbued, as well as the need for participation from these actors, and in that sense opens the way for these actors to be considered as an integral part of knowledge production. On one side, the framework presented casts public actors as being interested in KT policies for common reasons—the desire to increase competitivity, social welfare, innovation and development—with their role being mostly regulatory. But, on the other side, we noted that such an approach would only make sense when developed between regional HEI and CCS actors, and public policymakers; and this amounts in many ways to another form of knowledge transfer.

Finally, this work also points to a broader importance in considering the CCS. Noting the relevance of the social and cultural aspects of the CCS, recognized by the regional actors, such aspects seem to demand a greater understanding of the role of public society—both as end-users and as citizens—in mediating these processes. Through such an understanding, these underlying political models can be fine tuned in order to achieve greater innovation and socioeconomic wellbeing.

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Appendix A

Table A1. Documents Used in Content Analysis.

Author(s)	Geographical Scope	Country/Region Analyzed	Type of Document
Aguiar Losada (2014)	National	Spain	Research Document
André and Vale (2012)	Regional	Lisbon	Research Document
AURAN (2014)	Regional	Pays de la Loire	Official Policy Paper/Regional Guideline
CCDR-LVT (2015)	Regional	Lisbon	Official Policy Paper/Regional Guideline

CCT (2009)	Regional	Asturias	Official Policy Paper/Regional Guideline
CI (2017)	National	Ireland	Official Policy Paper/Regional Guideline
Costa and Lopes (2013)	Regional	Lisbon	Research Document
Costa et al. (2017)	Regional	Lisbon	Strategic Document
Costa et al. (2011)	Regional	Lisbon	Research Document
Cruz (2016)	National	Portugal	Research Document
CS (2012)	Regional	Scotland	Strategic Document
CS (2013)	Regional	Scotland	Strategic Document
CS (2014a)	Regional	Scotland	Strategic Document
CS (2014b)	Regional	Scotland	Strategic Document
CS (2014c)	Regional	Scotland	Official Policy Paper/Regional Guideline
CS (2015)	Regional	Scotland	Strategic Document
CS (2016)	Regional	Scotland	Strategic Document
CS (2017a)	Regional	Scotland	Official Policy Paper/Regional Guideline
CS (2017b)	Regional	Scotland	Strategic Document
Cunningham et al. (2015)	Regional	Scotland	Strategic Document
CCT (2017)	Regional	Asturias	Strategic Document
DKM Economic Consultants (2009)	National	Ireland	Strategic Document
EGFSN (2017)	National	Ireland	Official Policy Paper/Regional Guideline
FAMP (2010)	Regional	Andalucia	Official Policy Paper/Regional Guideline
GANEC (2014)	National	Portugal	Strategic Document
Harvey (2016)	National	Ireland	Strategic Document
ICS-UL (2014)	National	Portugal	Strategic Document
IDEPA (2014)	Regional	Asturias	Official Policy Paper/Regional Guideline
IECA (2016)	Regional	Andalucia	Official Policy Paper/Regional Guideline
FMPAA (2013)	Regional	Asturias	Strategic Document

Indecon (2011)	National	Ireland	Strategic Document
Mateus (2010)	National	Portugal	Strategic Document
Mateus and Associados (2013)	National	Portugal	Strategic Document
MECD (2016)	National	Spain	Official Policy Paper/Regional Guideline
MECD (2017)	National	Spain	Official Policy Paper/Regional Guideline
Megaloci (2014)	National	Portugal	Strategic Document
Million+ (2008)	National	United Kingdom	Strategic Document
Muñoz (2012)	Regional	Asturias	Research Document
OECD (2010)	Regional	Andalucia	Strategic Document
RB (2011)	Regional	Bretagne	Official Policy Paper/Regional Guideline
RB (2013)	Regional	Bretagne	Official Policy Paper/Regional Guideline
RB (2014)	Regional	Bretagne	Official Policy Paper/Regional Guideline
RB (2017)	Regional	Bretagne	Official Policy Paper/Regional Guideline
RB (2018)	Regional	Bretagne	Official Policy Paper/Regional Guideline
RPL (2008)	Regional	Pays de la Loire	Official Policy Paper/Regional Guideline
RPL (2014)	Regional	Pays de la Loire	Official Policy Paper/Regional Guideline
RPL (2017)	Regional	Pays de la Loire	Official Policy Paper/Regional Guideline
Sánchez and Vega (2014)	Regional	Andalucia	Research Document
SAC (2009)	Regional	Scotland	Strategic Document
SAC (2016)	Regional	Scotland	Strategic Document
US (2011)	Regional	Scotland	Strategic Document

Source: Own Elaboration.

Table A2. Summary Statistics; CCS and Sectorial Employment statistics calculated on average of NUTS2 Regions; remaining comparative statistics on EU average.

Indicators	Lisbon	Bretagne	Pays de la Loire	Andalucia	Asturias	South Western Scotland	SandEI
Population of region (% of country)	27.0	4.96	5.5	18.09	2.2	43.55	73.54
Regional % of Country's GDP	36.0	4.00	4.97	13.0	2.0	40.0	84.0
CCS % of Total GVA	19.4 Above Average	16.6 Average	17.18 Above Average	12.67 Below Average	13.0 Below Average	17.71 Above Average	25.6 Very High
Sectorial Employment	25.0 Very High	13.3 Below Average	15.5 Average	15.6 Average	36.3 Very High	17.3 Average	20.5 Above Average
Higher Education Levels	33.5 Average	33.8 Average	32.2 Average	29.1 Average	40.7 High	46.1 High	45.2 High
Unemployment	10.8 High	7.3 Average	7.3 Average	26.7 Very High	16.2 Very High	4.3 Low	6.6 Below Average
Innovation	90.6 Average	104.5 Average		68.49 Low	66.76 Low	129.2 Above Average	118.6 Above Average
Patent Score	0.29	0.36		0.11	0.15	0.29	0.27
Design Score	0.32	0.38		0.32	0.31	0.32	0.37
Trademark Score	0.31	0.25		0.35	0.19	0.29	0.41
Medium and High Tech Manufacturing	0.53	0.40		0.31	0.34	0.42	0.63

Source: Own elaboration with data from Eurostat.

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